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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

(43) International Publication Date  
21 June 2001 (21.06.2001)

PCT

(10) International Publication Number  
WO 01/45064 A1

(51) International Patent Classification<sup>7</sup>: G08C 17/02, H04Q 7/38

(21) International Application Number: PCT/IB00/01885

(22) International Filing Date:  
12 December 2000 (12.12.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
09/466,141 17 December 1999 (17.12.1999) US

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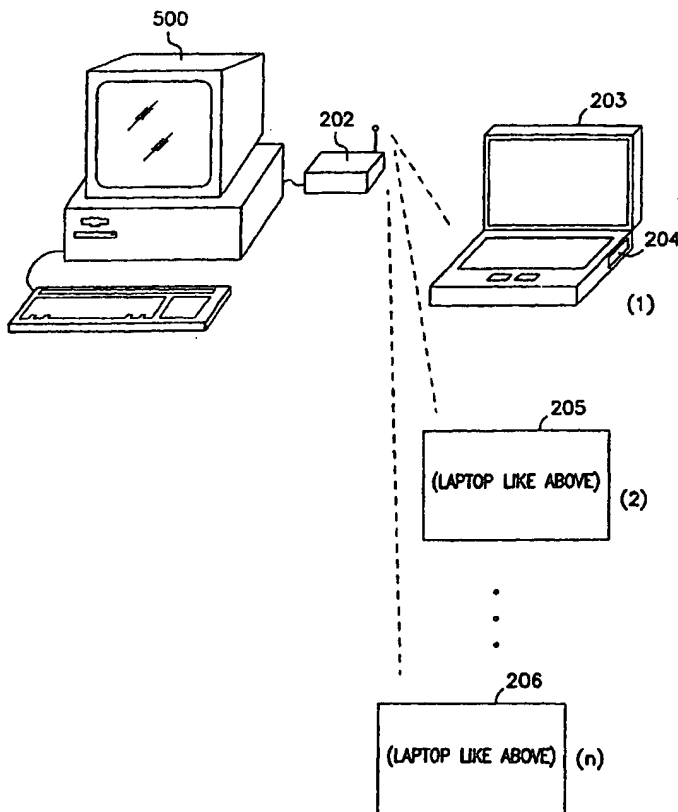
(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**  
— With international search report.  
— Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

[Continued on next page]

(54) Title: METHOD AND DEVICE FOR CONTROLLING THE OPERATION OF ELECTRONIC DEVICES IN AN AIRCRAFT



(57) Abstract: The present invention provides a method and apparatus that enables control via a wireless data connection of portable electronic devices while the devices are in an airplane. The wireless data connection of some embodiments is operable to control the power state of the portable electronic device via the wireless data connection. The invention provides in further embodiments the ability to communicate other data such as flight data to the portable electronic devices via the wireless data connection. In some embodiments, the wireless data connection and portable electronic device comprise a Bluetooth wireless data connection operatively coupled to a portable computer.

WO 01/45064 A1

## METHOD AND DEVICE FOR CONTROLLING THE OPERATION OF ELECTRONIC DEVICES IN AN AIRCRAFT

**Field of the Invention**

The invention relates generally to wireless communication of data in  
5 computers, and more specifically to use of wireless communication to communicate  
between laptop computers or other electronic devices and an airplane data system in an  
airplane.

**Background**

Concerns over electrical interference caused by electronic devices operated  
10 onboard aircraft has led to prohibition of use of most electronic devices during certain  
portions of a flight. It is widely believed that many microprocessor-driven devices  
may emit radio frequency noise that can interfere with an airplane's communication or  
flight control systems, and so pose a safety risk to the operation of the airplane. Also,  
devices such as cellular phones that are designed to emit radio signals at certain  
15 frequencies are similarly subject to restricted use rules, due to the same concerns over  
interference with electronic systems within the airplane.

Specific classes of electronic devices are typically subject to restrictions on use  
that vary with the perceived risk of interference and ease of deactivation. For  
example, watches, pacemakers and hearing aids may usually be used at any time,  
20 while use of devices such as radio transmitters, cellular telephones and remote-  
controlled toys is often banned altogether. But, a certain class of mid-risk devices  
often may be used during flights, but are prohibited from use during takeoff and  
landing. Such devices include handheld calculators or computer games, portable

computer.

### **Brief Description of the Figures**

Figure 1 shows a block diagram of a general purpose computer as may be used  
5 to practice an embodiment of the present.

Figure 2 shows a block diagram of a system for controlling portable electronic devices on an airplane via a wireless connection, consistent with an embodiment of the present invention.

10

### **Detailed Description**

In the following detailed description of sample embodiments of the invention, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific sample embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to  
15 enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical, electrical, and other changes may be made without departing from the spirit or scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the invention is defined only by the appended claims.

20

The present invention provides a method and apparatus that enables control of portable electronic devices while in an airplane via a wireless data connection. The wireless data connection of some embodiments is operable to control the power state of the portable electronic device via the wireless data connection. In various

various peripheral devices, such as graphics devices, storage drives, network cabling, etc. Data-path chip 118 is also controlled by system controller 112 to assist in routing data between main memory 116, host bus 110, and PCI bus 120.

In one embodiment, PCI bus 120 provides a 32-bit-wide data path that runs at  
5 33 MHz. In another embodiment, PCI bus 120 provides a 64-bit-wide data path that runs at 33 MHz. In yet other embodiments, PCI bus 120 provides 32-bit-wide or 64-bit-wide data paths that runs at higher speeds. In one embodiment, PCI bus 120 provides connectivity to I/O bridge 122, graphics controller 127, and one or more PCI connectors 121 (i.e., sockets into which a card edge may be inserted), each of which  
10 accepts a standard PCI card. In one embodiment, I/O bridge 122 and graphics controller 127 are each integrated on the motherboard along with system controller 112, in order to avoid a board-connector-board signal-crossing interface and thus provide better speed and reliability. In the embodiment shown, graphics controller 127 is coupled to a video memory 128 (that includes memory such as DRAM, EDO  
15 DRAM, SDRAM, SGRAM or VRAM (Video Random-Access Memory)), and drives VGA (Video Graphics Adaptor) port 129. VGA port 129 can connect to industry-standard monitors such as VGA-type, SVGA (Super VGA)-type, XGA-type (eXtended Graphics Adaptor) or SXGA-type (Super XGA) display devices. Other input/output (I/O) cards having a PCI interface can be plugged into PCI connectors  
20 121.

In one embodiment, I/O bridge 122 is a chip that provides connection and control to one or more independent IDE connectors 124-125, to a USB (Universal Serial Bus) port 126, and to ISA (Industry Standard Architecture) bus 130. In this

structures and memory arrangements are specifically contemplated and are within the scope of the invention. For example, the computer system of Figure 1 is in one embodiment of the invention implemented as a portable laptop computer system equipped with wireless data communication capability.

5           Figure 2 illustrates a system for controlling portable electronic devices on an airplane via a wireless connection, consistent with an embodiment of the present invention. Embodiments of both the apparatus and of methods of use of the apparatus consistent with the present invention are described herein, with reference to the elements of Figure 2.

10           An electronic device control apparatus 201 has operatively coupled to it a wireless communication device 202 operable to send a wireless signal. The electronic device control apparatus is in some embodiments a personal computer with software executing thereon that enables the computer to send various signals via the wireless communication device 202. The wireless communication device 202 is in various  
15           embodiments an infrared interface such as an IrDA (Infrared Data Association) interface, a radio-frequency interface such as a Bluetooth wireless interface, or any other suitable device. In various embodiments, the wireless communication device is operable only to broadcast or to send data, while in other embodiments the wireless communication device comprises a transceiver that supports 2-way communication.

20           The electronic device control apparatus 201 utilizes the wireless communication device 202 to communicate with at least one portable electronic device 203. The portable electronic device 203 may be any portable electronic device, including in various embodiments portable computers, cellular telephones, personal

The electronic device or devices are capable of receiving the transmitted data via the wireless signal receiving devices 204 associated with each electronic device, and are further capable of altering the electronic device power state in response to the transmitted signal. For example, where the signal indicates that the devices are to

5 operate in reduced power state to reduce radio frequency emissions, each portable electronic device receives the signal and reduces its power state if necessary. In various embodiments, the portable electronic devices may in response to such a signal either power up or power down entirely, or may increase or reduce function such that the potential for radiated interference during decreased function is greatly reduced.

10 For example, a device may reduce its clock speed in response to a signal indicating a reduced power state, where the reduction in clock speed results in a reduction in high-frequency radio frequency emissions.

In still further embodiments, the wireless data connection is further operable to transmit flight data information or other data, providing additional data to the portable

15 electronic devices 203, 205, and 206. The flight data comprises data such as arrival and departure times, flight maps, food and beverage service information, in-flight entertainment information, or other similar information. In still other embodiments, the wireless data connection provides additional data, such as a connection to the Internet or e-mail capability. Such enhanced capability may be provided in various

20 embodiments for a fee, or may be provided to passengers in certain classes of travel, or otherwise restricted in availability.

Communication between the electronic device control apparatus 201 and the at least one portable electronic device 203 is in some embodiments provided via a

### Claims

1. A method for remotely controlling the operation of at least one portable electronic device while the device is on an aircraft, comprising:
  - providing a data signal via a wireless data connection to the electronic device
  - 5 indicating a desired power state of the electronic device; and
  - changing the power state of the electronic device to the desired power state in response to the data signal if the current power state is not the desired power state.
2. The method of claim 1, wherein the wireless data connection comprises a Bluetooth  
10 wireless data connection.
3. The method of claim 1, further comprising transmitting flight-related data via the wireless data connection to the electronic device.
- 15 4. The method of claim 1, wherein the electronic device is a portable computer.
5. A method for remotely controlling the operation of at least one portable electronic device while the device is on an aircraft, comprising providing a data signal via a wireless data connection to the electronic device indicating a desired power state of the  
20 electronic device, wherein the electronic device is operable to change its power state to the desired power state in response to the data signal if the current power state is not the desired power state.



the electronic device, the electronic device operable to change power state in response to the wireless signal.

13. The electronic device control apparatus of claim 12, wherein the electronic device  
5 comprises a portable computer.

14. The electronic device control apparatus of claim 12, further comprising a  
Bluetooth wireless data transmitter operable to send the wireless signal from the  
electronic device control apparatus to the at least one electronic device.

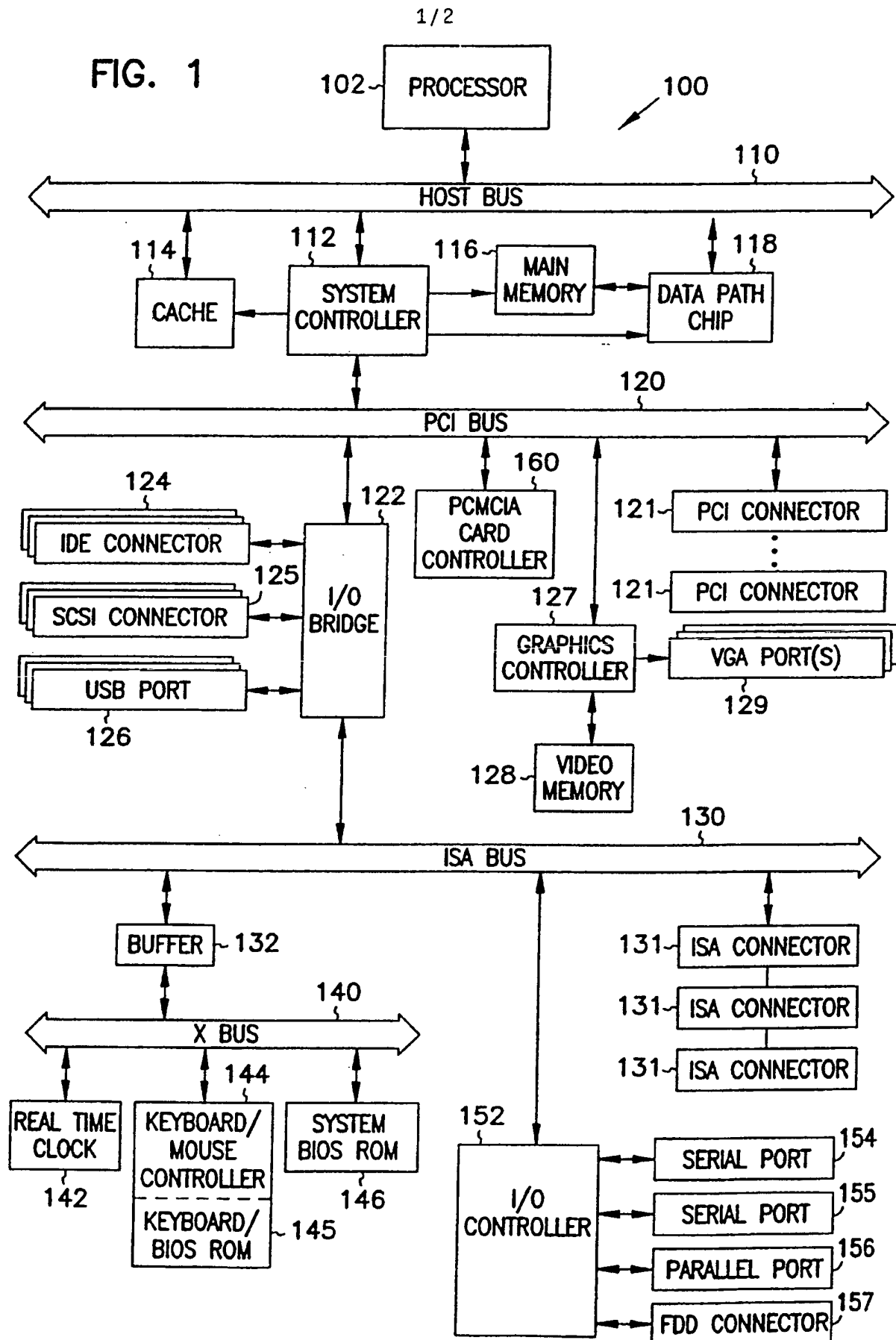
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15. The electronic device control apparatus of claim 12, further operable to provide  
flight data to the at least one electronic device via the wireless signal.

16. An electronic device for use on an airplane, the electronic device operable to:  
15 receive a wireless signal comprising desired power state data from an  
electronic device control apparatus; and  
change a power state of the electronic control device in response to the signal.

17. The electronic device of claim 16, wherein the electronic device comprises a  
20 portable computer.

18. The electronic device of claim 16, further comprising a wireless data receiver  
operable to receive the wireless signal from the electronic device control apparatus.



## INTERNATIONAL SEARCH REPORT

Internal . Application No

PCT/IB 00/01885

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G08C17/02 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 55102 A (ISRAELI GIL ;TE ENI BEN (IL); NETLINE COMMUNICATIONS TECHNOL (IL)) 28 October 1999 (1999-10-28)  page 3, line 22 - line 28 page 9, line 10 -page 10, line 2 page 12, line 27 -page 13, line 20 page 20, line 22 -page 21, line 31 ---	1,2,5,6, 8,9,12, 14,16, 18,19
X	DE 197 30 595 C (HEYNEN KLAUS) 12 November 1998 (1998-11-12)  column 1, line 3 - line 14 column 2, line 50 -column 3, line 13 column 4, line 27 - line 47 --- -/--	1,4,5,8, 11-13, 16-18

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

9 April 2001

Date of mailing of the international search report

17/04/2001

Name and mailing address of the ISA

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Authorized officer

Pham, P

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Internas / Application No

PCT/IB 00/01885

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